

This listing of claims will replace all prior versions, and listings, of claims in the application.

### LISTING OF CLAIMS

1. (currently amended) A method for the computer-aided determination of a  
5 measure of similarity between a first structure and at least one predetermined  
second structure, comprising the steps of:
- defining at least one base element for said first structure and said second  
structure;
- 10 assigning surroundings-related information to each of said at least one  
base elements, said surroundings-related information  
characterizing a corresponding said base element; and
- determining a measure of similarity, which describes a similarity between  
said first structure and said second structure, for said first structure  
and said second structure, said measure of similarity being  
15 determined in a manner dependent on said base elements and on  
said surroundings-related information assigned to said base  
elements;
- forming said surroundings-related information by further base elements  
and their geometrical arrangement relative to said at least one base  
20 element
- grouping further base elements into a plurality of surroundings-related  
information types containing surroundings-related information  
features which are each assigned to a surroundings-related  
information type;
- 25 sorting said surroundings-related information features assigned to a  
surroundings-related information type in a predeterminable manner  
in a list; and
- storing said sorted said surroundings-related information features.

2. (previously presented) The method as claimed in claim 1, further  
comprising the step of including a plurality of base elements within said first  
5 structure or said second structure.

3. (previously presented) The method as claimed in claim 1, further  
comprising the step of including said first structure and said second structure in  
at least one map.  
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4. (previously presented) The method as claimed in claim 3, further  
comprising the step of using a recorder to record said at least one map.

5. (previously presented) The method as claimed in claim 4, wherein said  
15 recorder is a scanner.

6. (previously presented) The method as claimed in claim 4, wherein said  
recorder is a camera.

20 7. (previously presented) The method as claimed in claim 1, wherein said  
step of determining a measure of similarity encompasses a plurality of base  
elements and their respectively assigned surroundings-related information.

8. (previously presented) The method as claimed in claim 1, wherein at least  
25 a portion of said at least one base element is a line of predeterminable form.

9. (previously presented) The method as claimed in claim 8, wherein at least  
a portion of said at least one base element is a section.

30 10. (previously presented) The method as claimed in claim 1, wherein at least  
a portion of said at least one base element is a point.

11. (cancelled).

12. (previously presented) The method as claimed in claim 1, wherein base  
5 elements have different forms.

13. (previously presented) The method as claimed in claim 3, further  
comprising the step of forming at least a portion of said surroundings-related  
information in such a way that it is invariant with respect to errors which occur  
10 when constructing said at least one map.

14-15. (cancelled).

16. (previously presented) The method as claimed in claim 1, wherein said  
15 measure of similarity is determined with dynamic programming.

17. (previously presented) The method as claimed claim 1, further comprising  
the step of operating on a plurality of further structures, a measure of similarity  
between said first structure and a respective further structure being determined  
20 in each case.

18. (previously presented) The method as claimed in claim 17, further  
comprising the step of implementing said method repeatedly for different base  
elements, thus forming a plurality of measures of similarity.  
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19. (previously presented) The method as claimed in claim 17, further  
comprising the steps of:

selecting base elements of said first structure and of said further  
structures which have the greatest correspondence;

30 forming a local coordinate system in each case proceeding from said  
selected base elements in each structure;

forming a mapping measure in a manner dependent on a mapping of said  
coordinate system of said first structure onto a coordinate system  
of said second structure;

5 determining a structure which has the smallest mapping measure in a  
manner dependent on said mapping measure.

20. (previously presented) The method as claimed in claim 19, wherein said  
mapping measure describes a rotation of said local coordinate system from said  
first structure onto said respective further structure.

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21. (previously presented) The method as claimed in claim 1, wherein said  
first structure or said second structure describes data structures in a database.

22. (previously presented) The method as claimed in claim 1, wherein said  
15 first structure or said second structure describes a physical object.

23. (previously presented) The method as claimed in claim 1, wherein said  
first structure describes a physical object and said second structure describes a  
model of a physical object.

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24. (previously presented) The method as claimed in claim 1, further  
comprising the step of determining a map for a mobile autonomous apparatus.

25. (previously presented) The method as claimed in claim 1, further  
25 comprising the step of orientating a mobile autonomous apparatus.

26. (previously presented) The method as claimed in claim 24, wherein said  
mobile autonomous apparatus is a robot.

27. (currently amended) An arrangement for the computer-aided determination of a measure of similarity between a first structure and at least one predetermined second structure, comprising:

a processor configured to:

5 define at least one base element for said first structure and said second structure;

assign surroundings-related information to each base element, said surroundings-related information characterizing a corresponding base element; and

10 determine a measure of similarity, which describes a similarity between said first structure and said second structure, for said first structure and said second structure, said measure of similarity being determined in a manner dependent on said at least one base element and on said surroundings-related information assigned to  
15 said respective base elements;

operate on said further base elements that are grouped into a plurality of surroundings-related information types containing surroundings-related information features which are each assigned to a surroundings-related information type;

20 the arrangement further comprising:

further base elements and their geometrical arrangement relative to said base elements that form said surroundings-related information; and

a memory, in which said surroundings-related information features assigned to a surroundings-related information type are stored  
25 having been sorted in a predeterminable manner in a list.

28. (previously presented) The arrangement as claimed in claim 27, wherein a plurality of base elements are contained in said first structure or said second structure.

29. (previously presented) The arrangement as claimed in claim 27, wherein said first structure or said second structure is contained in at least one map.

5 30. (previously presented) The arrangement as claimed in claim 29, further comprising a recorder for recording said at least one map.

31. (previously presented) The arrangement as claimed in claim 30, wherein said recorder is a scanner.

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32. (previously presented) The arrangement as claimed in claim 30, wherein said recorder is a camera.

15 33. (previously presented) The arrangement as claimed in claim 27, wherein said measure of similarity is determined based on a plurality of base elements and their respectively assigned surroundings-related information.

20 34. (previously presented) The arrangement as claimed in claim 27, wherein said processor is configured to operate on said at least one base element that is a line of predeterminable form.

25 35. (previously presented) The arrangement as claimed in claim 34, wherein said processor is configured to operate on at least a portion of said at least one base element that is a section.

36. (previously presented) The arrangement as claimed in claim 27, wherein said processor is configured to operate on at least a portion of said at least one base element that is a point.

30 37. (cancelled).

38. (previously presented) The arrangement as claimed in claim 27, wherein said processor is configured to operate on base elements having different forms.

5 39. (previously presented) The arrangement as claimed in claim 27, wherein said processor is configured to operate on at least a portion of said surroundings-related information that is formed in such a way that it is invariant with respect to errors which occur when constructing a map.

40-41. (canceled).

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42. (previously presented) The arrangement as claimed in claim 27, wherein said processor is configured to utilize dynamic programming to form said measure of similarity.

15 43. (previously presented) The arrangement as claimed in claim 27, wherein said processor is configured to process a plurality of further structures, a measure of similarity between said first structure and a respective further structure being determined in each case.

20 44. (previously presented) The arrangement as claimed in claim 43, wherein said processor operates repeatedly on different base elements, and forms a plurality of respective measures of similarity.

25 45. (previously presented) The arrangement as claimed in claim 43, wherein said processor is configured to:

select base elements of said first structure and of said further structures  
which have the greatest correspondence;

form a local coordinate system in each case proceeding from said  
selected base element in each structure;

form a mapping measure in a manner dependent on a mapping of said  
coordinate system of said first structure onto said coordinate  
system of said second structure; and  
determine a structure which has the smallest mapping measure in a  
5 manner dependent on said mapping measure.

46. (previously presented) The arrangement as claimed in claim 45, wherein  
said mapping measure describes a rotation of said local coordinate system from  
said first structure onto a respective further structure.

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47. (previously presented) The arrangement as claimed in claim 27, wherein  
said structures describe data structures in a database.

48. (previously presented) The arrangement as claimed in claim 27, wherein  
15 said structures each describe a physical object.

49. (previously presented) The arrangement as claimed in claim 27, wherein  
said first structure describes a physical object and said second structure  
describes a model of a physical object.

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50. (previously presented) The arrangement as claimed in claim 29, wherein  
said map is utilized for a mobile autonomous apparatus.

51. (previously presented) The arrangement as claimed in claim 29, wherein  
25 said arrangement orients a mobile autonomous apparatus.

52. (previously presented) The arrangement as claimed in claim 50, wherein  
said mobile autonomous apparatus is a robot.

30 53. (previously presented) The method as claimed in claim 25, wherein said  
mobile autonomous apparatus is a robot.



54. (previously presented) The arrangement as claimed in claim 38, wherein  
said processor is configured to operate on said further base elements that are  
grouped into a plurality of surroundings-related information types containing  
5 surroundings-related information features which are each assigned to a  
surroundings-related information type.

55. (previously presented) The arrangement as claimed in claim 39, wherein  
said processor is configured to operate on said further base elements that are  
10 grouped into a plurality of surroundings-related information types containing  
surroundings-related information features which are each assigned to a  
surroundings-related information type.

56. (previously presented) The arrangement as claimed in claim 54, further  
15 comprising:  
a memory, in which said surroundings-related information features  
assigned to a surroundings-related information type are stored  
having been sorted in a predeterminable manner in a list.

20 57. (previously presented) The arrangement as claimed in claim 55, further  
comprising:  
a memory, in which said surroundings-related information features  
assigned to a surroundings-related information type are stored  
having been sorted in a predeterminable manner in a list.

25 58. (previously presented) The arrangement as claimed in claim 51, wherein  
said mobile autonomous apparatus is a robot.